

Warm Up # 2-1

1. Find the mean, median and mode of the data by hand.

4, 5, 6, 6, 6, 7, 7, 8, 9, 10

2. Now add the extreme value 100 to the data set.

Find the mean, median and mode, then comment on the effect of the outlier on all three measures of center.

p. 175 The effect of outliers on
Measures of Central Tendency

Mode:	<ul style="list-style-type: none">• gives the most usual value• only takes common values into account• not affected by extreme values
Mean:	<ul style="list-style-type: none">• commonly used and easy to understand• takes all values into account• affected by extreme values
Median:	<ul style="list-style-type: none">• gives the halfway point of the data• only takes middle values into account• not affected by extreme values

HW Questions:

EXERCISE 6E.1

- 1 Phil kept a record of the number of cups of coffee he drank each day for 15 days:

2, 3, 1, 1, 0, 0, 4, 3, 0, 1, 2, 3, 2, 1, 4

Without using technology, find the **a** mode **b** median **c** mean of the data.

- 2 The sum of 7 scores is 63. What is their mean?

- 7 A bus and tram travel the same route many times during the day. The drivers counted the number of passengers on each trip one day, as listed below.

Bus							Tram						
30	43	40	53	70	50	63	58	68	43	45	70	79	
41	38	21	28	23	43	48	38	23	30	22	63	73	
20	26	35	48	41	33		25	35	60	53			

- a** Using technology, calculate the mean and median number of passengers for both the Bus and Tram data.
- b** Comment on which mode of transport is more popular. Explain your answer.

- 8 A basketball team scored 43, 55, 41, and 37 points in their first four matches.

- a** What is the mean number of points scored for the first four matches?
- b** What score will the team need to shoot in their next match so that they maintain the same mean score?
- c** The team scores only 25 points in the fifth match. Find the mean number of points scored for the five matches.
- d** The team then scores 41 points in their sixth and final match. Will this increase or decrease their previous mean score? What is the mean score for all six matches?



- 9 This year, the mean monthly sales for a clothing store have been \$15 467. Calculate the total sales for the store for the year.
- 10 While on an outback safari, Bill drove an average of 262 km per day for a period of 12 days. How far did Bill drive in total while on safari?
- 11 Towards the end of the season, a netballer had played 14 matches and had thrown an average of 16.5 goals per game. In the final two matches of the season she threw 21 goals and 24 goals. Find the netballer's new average.

- 12 Find x if 5, 9, 11, 12, 13, 14, 17, and x have a mean of 12.
- 13 Find a given that 3, 0, a , a , 4, a , 6, a , and 3 have a mean of 4.

- 14 Over the complete assessment period, Aruna averaged 35 out of 40 marks for her maths tests. However, when checking her files, she could only find 7 of the 8 tests. For these she scored 29, 36, 32, 38, 35, 34, and 39. How many marks out of 40 did she score for the eighth test?
- 15 A sample of 10 measurements has a mean of 15.7 and a sample of 20 measurements has a mean of 14.3. Find the mean of all 30 measurements.

- 16 The mean and median of a set of 9 measurements are both 12. Seven of the measurements are 7, 9, 11, 13, 14, 17, and 19. Find the other two measurements.
- 17 Jana took seven spelling tests, each with twelve words, but she could only find the results of five of them. These were 9, 5, 7, 9, and 10. She asked her teacher for the other two results and the teacher said that the mode of her scores was 9 and the mean was 8. Given that Jana knows her worst result was a 5, find the two missing results.

median = 12, so 12 is a number in the set of 9 measurements.

$$x, 7, 9, 11, 12, 13, 14, 17, 19$$

4 #'s 4 #'s

$$\bar{x} \Rightarrow \frac{x + 102}{9} = 12$$

\downarrow
 $x =$

So $x \leq 12$

17) Mode = 9

$$\bar{x} = 8$$

worst = 5

∴ missing scores > 5

5, 7, 9, 9, 10

Let x & y be the other 2 scores.

$$\frac{40 + x + y}{7} = 8$$

\downarrow
 $x + y = 16$

2 #'s that add to 16

$$6 + 10$$

$$7 + 9$$

$$8 + 8$$

The only way we still have a mode = 9

Today's plan:

- * Understand the effect of outliers on measures of central tendency.
- * Calculate mean by hand and with grapher.
 - 1) from a frequency table
 - 2) from grouped data
- * Create a boxplot and find the 5-figure summary.

Classwork:

Name:

Per:

Team:

1. A boy rolled a die 50 times with the following results:

$n = 50$

Score	Frequency	cum
1	9	9
2	10	19
3	5	24
4	8	
5	7	
6	11	

Calculate the mean score by hand and show critical totals.

$$\bar{x} = \frac{1(9) + 2(10) + 3(5) + 4(8) + 5(7) + 6(11)}{50} = \frac{177}{50}$$

Also find the median and state the mode.

4

6

$$\bar{x} = 3.54$$

2. Enter Score in L_1 and Frequency in L_2 , then use 1-Var Stats to calculate the mean.

Would you use a column graph or a histogram to graph this data?

3. Below is data that has been collected and grouped. The actual data is not available. Estimate the mean score, showing the correct formula and critical values by hand.

Score (x)	Frequency (f)	midpoints	(mp)(f)
1-5	7	3	21
6-10	12	8	
11-15	15	13	
16-20	10	18	
21-25	11	23	

$$\sum f = 55$$

= n

$$\sum (mp)(f) = 745$$

$$\bar{x} \approx 13.5$$

$$\bar{x} \approx \frac{\sum (mp)(f)}{\sum f}$$

$$\bar{x} \approx \frac{745}{55}$$

Which is the median class interval? 11 - 15

Now enter midpoints in L₁ and frequencies in L₂, then use 1-Var Stats to check the mean and median.

With your team, read aloud p. 183:

The Quartiles and Interquartile Range

4. 16 students took a test earning the following scores:

4, 24, 22, 20, 17, 22, 9, 12, 9, 9, 25, 20, 21, 17, 16, 22

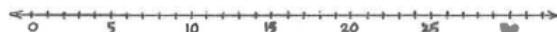
Find (with a graphing calculator if you wish):

- median
- mean
- mode
- quartile one
- quartile three
- interquartile range
- range

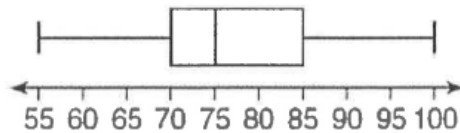
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Read p. 186 together, then

Construct a box and whisker



5. The box and whisker plot below shows scores on a science test.



- a) 75% of the scores were above _____.
- b) The median score is _____.
- c) 50% of the scores were between _____ and _____.

Fill in the 5-point summary and the IQR:

low _____ Q_1 _____ Med _____ Q_3 _____ high _____

IQR _____

HW 2-1: 6E.2 p.175 #1
 6E.3 p.178 #1 (by hand)
 and # 2 (grapher)
 6E.4 p.181 #1 (by hand)
 and # 4 (grapher)
 6F p.184 # 2
 6G.1 p. 188 # 2

HW Quiz tomorrow on
 last week's HW